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10/648,492

08/25/2003

Yutaka Miyasaka

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11/18/2004

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EXAMINER

GLEITZ, RYAN M

ART UNIT

PAPER NUMBER

2852

DATE MAILED: 11/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/648,492

Applicant(s)

MIYASAKA ET AL.

Examiner

Ryan Gleitz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3,6,9,12 and 15 is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,7,8,10,11,13 and 14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 7, 8, 10, 11, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hibino et al. (US 6,473,584) in view of Ogiri et al. (JP 07-253705).

Hibino et al. disclose an image forming apparatus including developing means (27) for developing an electrostatic latent image on an image carrier (3) by using a two-component

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developing agent (col. 6, line 24) containing polymerized toner, the developing means (27) comprising: a supply/convey member (24) in the form of a spiral screw which conveys the two-component developing agent in an axial direction while agitating the developing agent; wherein the supply/convey member has a diameter of 10 to 25 mm (col. 7, lines 36-37), which reads on a diameter of not less than 23 mm.

Regarding claim 2, a carrier average particle diameter R_c (um) is 35 (col. 6, line 30), and R_h is 25 from above, satisfying $R_h \geq -0.891 * R_c + 26.008$.

Hibino et al. do not disclose a toner density sensor.

However, Ogiri et al. disclose an image forming apparatus including a toner density sensor (440) which is placed to oppose a supply/convey member (413) and detects a toner density.

Regarding claims 7 and 8, the toner density sensor (440) comprises a sensor which detects a change in permeability (abstract, line 4).

Regarding claims 10 and 11, figure 1 illustrates a perpendicular bisector of a head surface of the toner density sensor (440) passes through a central axis of the supply/convey member (413).

Regarding claims 13 and 14, the supply/convey member (413) is in a non-contact state with respect to the head surface of the toner density sensor (440), and a gap (B) therebetween is set to 0.4 mm or less ([0018], line 8), which reads on not more than 0.8 mm.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image forming apparatus of Hibino et al. with the toner density sensor

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taught by Ogiri et al. to manage the toner concentration in a developer with a sufficient precision in order to obtain a good transfer picture ([0002]).

Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hibino et al. (US 6,473,584) in view of Ogiri et al. (JP 07-253705) as applied to claims 1, 2, 7, 8, 10, 11, 13, and 14 above, and further in view of Sato (US 6,249,664).

Hibino et al. disclose the image forming apparatus above including a supply/convey member (24) with a screw pitch of 20 mm (col. 7, line 56), which reads on 16 to 33 mm, but are silent on the rotation speed of the supply/convey member.

However, Sato discloses an image forming apparatus with a supply/convey member (146, 147) operated at a speed of 100 to 300 rpm, which reads on 3 to 10 rps.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the supply/convey member of Hibino et al. with the rotational speeds taught by Sato to improve the toner saturation time required for the toner to arrive at the prescribed density value (col. 14, lines 5-32).

Allowable Subject Matter

Claims 3, 6, 9, 12, and 15 are allowed.

The following is an examiner's statement of reasons for allowance:

Claims 3, 6, 9, 12, and 15 are considered patentable because of the inclusion of the claim limitations, a relationship between a carrier average particle diameter and a head diameter of the

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toner density sensory satisfies $R_s \leq 0.13333 * R_c + 1.3333$, that is not taught by or suggested by the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Other Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kobayashi et al. (US 6,104,892) disclose a image forming apparatus relating the size of an agitating member and the size of a toner density sensor.

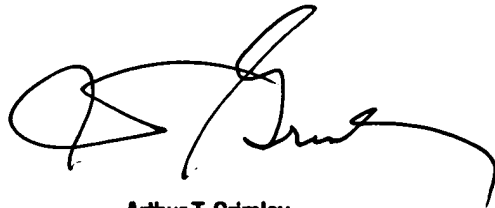
Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Gleitz whose telephone number is (571) 272-2134. The examiner can normally be reached on Monday-Friday between 9:00AM and 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Arthur Grimley can be reached on (571) 272-2136. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

rg

A handwritten signature in black ink, appearing to read 'A. T. Grimley', with a stylized, flowing script.

Arthur T. Grimley
Supervisory Patent Examiner
Technology Center 2800